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ABSTRACT

This study involved the investigation of the differential validity hypothesis as it pertained to the disadvantaged college student. It evaluated, by means of a multiple regression analysis, the use of SAT scores (Math and Verbal) and the Nelson-Denny Reading Test as predictors of college success, as measured by semester grade point average, for students who were provisionally accepted to Towson State University. Significant correlations were found for all three variables as a total set and the individual comparisons of the independent variables with semester grade point average. It was noted that only 7% of the variance was accounted for by these variables, therefore, further investigation into motivational variables would be indicated. Due to the regression analysis indicating that the Nelson-Denny Test and the SAT Math scores accounted for most of the significance in determining success, it was suggested that these variables be given greater emphasis in admissions criteria for the disadvantaged student. (Author)

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Cognitive Predictors of College Success in Disadvantaged Students

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Cognitive Predictors of College Success in Disadvantaged Students

The investigation of the differential validity hypothesis (the success criteria and predictors for the disadvantaged student are not the same as those for the traditionally admitted student) has been undertaken at great length (Friedlander 1971). This investigation mainly has been precipitated by the increasingly large number of disadvantaged students being admitted to universities and colleges in reply to equal education opportunity rights.

The criteria for admission in many cases continue to be SAT Math and Verbal scores, high school G.P.A., achievement tests, and/or various other aptitude measures for these students. Research has indicated that these criteria are indeed valid predictors. Baggaley (1974) showed that aptitude and achievement tests were better predictors of college success for disadvantaged students than was the high school G.P.A. He went on to say that these were better predictors for disadvantaged students than for traditionally admitted students. It has also been shown that as the number of credits completed by a student in-

creases, the predictive correlation of the SAT scores increases (Siegelman, 1971). Therefore, SAT scores do indicate a positive correlation to college success of disadvantaged students (as measured by grade point average).

Reading tests in addition to SAT's are often used for placement and admission criteria for disadvantaged students. One test frequently used is the Nelson-Denny Reading Test (1960). Towsend (1968) states that this is a challenging test with a highly academic flavor....with a rate score that may prove useful for college textbook reading. She continues to say that this test will be useful for surveying the growth of reading power in the college years and that it will be useful for college placement. As such, the inclusion of the Nelson-Denny Reading Test in a college entrance battery would be a useful tool in predicting success.

Therefore, it is the purpose of this study to evaluate by means of a multiple regression analysis, the relationship of SAT scores (math and verbal) and Nelson-Denny Reading Test scores with G.P.A. for disadvantaged students after one year of college.

Method:

Subjects: Eighty-three out of a total population of ninety-eight provisionally accepted students were selected on the basis of having completed two semesters of college courses. These subjects were defined as provisional because they did not meet the normal academic standards for admission into Towson State University in 1975.

Procedure: The scores subjects obtained on the Scholastic Aptitude Verbal and Math Tests together with a raw total score that reflected reading comprehension and vocabulary competency on the Nelson-Denny Reading Test, Form C, were collected. The SAT verbal and math scores were those the subjects submitted to the admissions office to be used as acceptance criteria. The Nelson-Denny Reading Test was administered during the first week of classes to all the provisional students as part of a Communication Skills course they were required to take their first semester. The scores from these two tests, SAT and Nelson-Denny Reading Test, were then analyzed as to how they correlated to an adjusted cumulative grade point average which is based on a 4.0 point system. The subjects' grade point average was a cumulative one which reflected two semesters

of college courses. This grade point average was then multiplied by the number of semester hours completed by the student for those two semesters. This product was then divided by twenty-eight credits, the amount of credits required in order to be considered a second year student. This adjustment to the grade point average was required because of a college policy that did not utilize F grades as a reflection of non-acceptable performance in a college course. Instead a grade of NC (no credit) was used, but this did not affect the student's average. Therefore, a student could take four courses and get an A in one and fail the other three. Under the system of NC for failed courses, this student would receive a 4.0 grade point average for the semester. This policy also only required a student to complete a total of 12 credits which reflected at least a 1.50 cumulative grade point average, in order to avoid being academically dismissed.

The scores from the SAT and Nelson-Denny Reading Test were then correlated with the adjusted grade point average by means of a multiple regression analysis.

Results:

Insert Table I here

Table I shows the correlation coefficients between grade point average, the criterion, and SAT Verbal, SAT Math, and Nelson-Denny Reading Test, the predictor variables.

The data shows significant correlations for all three variables -- SAT Verbal, SAT Math, and Nelson-Denny Reading Test -- with GPA. The highest correlation is seen between Nelson-Denny Reading Test and college GPA ($r = .26$). SAT Math and SAT Verbal, respectively, were also shown to be significant. Although these correlations are statistically significant, they account for only 7% of the variance.

Insert Table II here

Table II shows the resultant F values of a step-wise multiple regression analysis of GPA with Nelson-Denny Read-

ing Test, SAT Math, and SAT Verbal.

This data does show significant results in analyzing the effects of the test variables on GPA. The highest F value is seen with the Nelson-Denny Reading Test on GPA. SAT Math and SAT Verbal, respectively, were also shown to be significantly related to GPA, but to a lesser extent than the Nelson-Denny Reading Test.

Discussion

The results do indicate positive correlations for the use of SAT scores and Nelson-Denny Reading scores ($r = .26$, $p \leq .05$) with the highest correlation being between Nelson-Denny and GPA. Also, the Nelson-Denny met the significance criterion in the step-wise multiple regression, [$F(1,81) = 5.99$, $p \leq .05$], to a much higher degree than did the variables SAT Math and SAT Verbal. These results indicate the possible validity and reliability of the inclusion of the Nelson-Denny Reading Test in a battery of college entrance tests.

The results of both the step-wise multiple regression and correlation coefficients show that SAT Math scores are better correlates with GPA than SAT Verbals for this sample of students. This indicates that perhaps the cognitive

skills that are assessed by the SAT Math are better indicators of college success for this type of student than those skills assessed by the SAT Verbal scores.

The fact that these variables, SAT scores and Nelson-Denny Reading scores, only account for 7% of the variance does indicate that some other type of assessment should be incorporated into the college entrance battery. Motivational factors have been suggested by the results of many studies (Heilbrun, 1965, Tractman, 1976) as accounting for a great deal of the remaining variance.

Therefore, cognitive variables that show a significant ability to predict GPA include Nelson-Denny, SAT Math and SAT Verbal, respectively. As such it is suggested that greater emphasis be placed on the Nelson-Denny Reading Test and SAT Math scores for cognitive variables to assess future college success for these students. It is also suggested that research of non-cognitive nature -- motivational -- be conducted and used in a battery of admission assessment measures for these students.

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TABLE I

Pearson R Correlation Coefficients Between GPA and Test Variables

	r	r^2
SAT Verbal	.21*	.04
SAT Math	.24*	.06
Nelson-Denny	.26*	.07

*$p < .05 = .211$

TABLE II

Step-wise Multiple Regressions of GPA with Test Variables

Variable	DF	SS	MS	F
ND Test				
Regression	1	1.40	1.40	
Residual	81	18.90	.23	5.99*
SAT Math				
Regression	2	1.90	.95	4.14*
Residual	80	18.40	.23	
SAT Verbal				
Regression	3	1.92	.64	2.75*
Residual	79	18.38	.23	

*$p < .05$